



DEFENSE HEALTH BOARD  
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FALLS CHURCH, VA 22041-3206

DEC 10 2010

MEMORANDUM FOR: GEORGE PEACH TAYLOR, JR., M.D., DEPUTY ASSISTANT SECRETARY OF DEFENSE (FORCE HEALTH PROTECTION AND READINESS), PERFORMING THE DUTIES OF THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)

SUBJECT: Defense Health Board Recommendation Memorandum Pertaining to Tactical Combat Casualty Care Guidelines on the Prevention of Hypothermia

The Defense Health Board (DHB) met in open session on August 18, 2010, during which the Board deliberated proposed recommendations regarding the revised Tactical Combat Casualty Care (TCCC) Guidelines on the Prevention of Hypothermia. The recommendation memorandum is at TAB A.

In order to expedite the implementation of current best practices for the prevention of hypothermia among combat casualties, the Board recommends the newly revised TCCC guidelines with the expectation that the Committee on Tactical Combat Casualty Care (CoTCCC), a Work Group of the DHB, provides and maintains an ongoing review of the context of the guidelines. Specifically, the CoTCCC shall evaluate the effectiveness of alternative therapies through the utilization of civilian and military pre-hospital trauma literature, interaction with military combat casualty care research laboratories, input from experienced combat corpsmen and medics, case reports provided to the Joint Theater Trauma System, regular interaction with the Service military medical lessons learned centers, and expert opinion from both military and civilian leaders. Data supported evaluation of the effectiveness of measures to prevent hypothermia should be pursued.

The DHB-endorsed TCCC Guidelines have incorporated the Heat Reflective Shell (HRS) to replace the Blizzard Survival Blanket as a result of its notably increased efficiency and added protection of the combat casualty. The newly revised guidelines are supported by studies conducted by the United States Institute of Surgical Research (please see attached references).

FOR THE DEFENSE HEALTH BOARD:

Wayne M. Lednar, M.D. Ph.D.  
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SUBJECT: Recommendations Regarding the Tactical Combat Casualty Care Guidelines on the Prevention of Hypothermia 2010-06

## INTRODUCTION

1. Tactical Combat Casualty Care (TCCC) is a set of trauma management guidelines customized for use on the battlefield. TCCC was first introduced in the Special Operations community, but the conflicts in Iraq and Afghanistan have seen TCCC be adopted by all services in the U.S. Military. They have previously recommended by Assistant Secretary of Defense for Health Affairs (ASD(HA)) to the Services as the recommended standard of care for combat trauma on the battlefield. Both the Navy and the Air Force Surgeons General have directed that changes to the TCCC Guidelines be implemented into the appropriate training courses as soon as approved by the Trauma and Injury Subcommittee and the Defense Health Board (DHB) and posted onto the Military Health System Web site.
2. The TCCC guidelines are reviewed quarterly by subject matter experts to ensure that they reflect the most current evidence-based practices. The Committee on Tactical Combat Casualty Care (CoTCCC), an expert advisory Subpanel to the Trauma and Injury Subcommittee of the DHB, performs these reviews and recommends updates as needed. The CoTCCC's Tri-Service membership includes the medical specialties of trauma surgery, emergency medicine, critical care medicine, and operational medicine. Combat medical educators and physician assistants are included as well. By charter, the CoTCCC includes the Trauma Consultants to all three of the Service Surgeons General and a minimum of 30 percent of the CoTCCC members must have experience as combat medics, corpsmen, or parajumpers (PJs). Although the CoTCCC includes civilian subject matter experts as well as military, nearly 100 percent of current CoTCCC members have deployed experience.
3. CoTCCC-recommended changes to the TCCC Guidelines are based on: 1) an ongoing review of the published civilian and military prehospital trauma literature; 2) ongoing interaction with military combat casualty care research laboratories; 3) direct input from experienced combat corpsmen, medics, and PJs; 4) case reports discussed on the weekly Joint Theater Trauma System performance improvement trauma teleconferences; 5) regular interaction with the service military medical lessons learned centers; 6) feedback from the Office of the Armed Forces Medical Examiner on autopsy findings in combat fatalities; and 7) expert opinion from both military and civilian trauma leaders.

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## BACKGROUND

4. Following a brief on August 3, 2010, the CoTCCC recommended proposed revisions to the TCCC Guidelines regarding hypothermia prevention. These changes were presented to the DHB Trauma and Injury Subcommittee and unanimously approved on August 4, 2010. The recommendations were then presented on behalf of the Subcommittee at the DHB meeting on August 18, 2010, and subsequently deliberated and passed unanimously by the Board in open session on August 18, 2010.
5. The most frequent cause of preventable death on the battlefield is hemorrhage. Hypothermia-induced coagulopathy is well-described and results from decreases in platelet function, slowing of coagulation cascade enzyme activity, and alterations of the fibrinolytic system. Even a small decrease in body temperature can interfere with blood clotting and increase the risk of exsanguination. Additionally, combat casualties in shock are at an even greater risk of hypothermic coagulopathy. Hypovolemic shock results in a decreased ability to produce heat and to maintain normal body temperature. Shock victims are thus predisposed to hypothermia. Due to the physics of heat transfer, hypothermia is far easier to prevent than it is to treat, so prevention of heat loss should begin as soon after wounding as the tactical situation permits.

## FINDINGS

6. Combat medics and Physician Assistants at the Army Department of Combat Medic Training (DCMT) have noted that the previously recommended Blizzard Survival Blanket did not allow easy access to the casualty. Additionally, the previously recommended hypothermia prevention cap tended to blow off the casualty's head in the presence of rotor wash.
7. A new hypothermia prevention blanket, the Heat Reflective Shell (HRS), has been developed that both allows easier access to the casualty and incorporates a hood into the blanket, eliminating the need for the hypothermia prevention cap.
8. The proposed revisions designate the HRS as the preferred passive component of heat loss prevention over the previous Blizzard Survival Blanket. Studies conducted by the U.S. Army Institute of Surgical Research (USAISR) have demonstrated that the HRS provides hypothermia protection that is at least as good as the Blizzard Survival Blanket. It also allows easier access to the casualty for reassessment and possible interventions by way of the Velcro strips down each side of the HRS. The mummy-type sleeping bag design also covers the head and reduces heat loss from this area.

## CONCLUSIONS

9. The Board recognizes the importance of preventing hypothermia in combat casualties. The Board approves and endorses the following changes to the TCCC Guidelines on the prevention of hypothermia and recommends that the Department endorse the following changes to the TCCC Guidelines to the Services.

## RECOMMENDATIONS

**10. Based on recent literature and expert opinion on the prevention of hypothermia in Tactical Field Care and Tactical Evacuation Care, the Board advises the Department that the changes to the TCCC Guidelines noted below should be incorporated into Service battlefield trauma care training programs (proposed changes are italicized):**

### **a. Tactical Field Care**

#### **7. Prevention of Hypothermia**

- (a) Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.**
- (b) Replace wet clothing with dry if possible. *Get the casualty onto an insulated surface as soon as possible.***
- (c) *Apply the Read-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK) to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).***
- (d) *If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready-Heat Blanket may also be used.***
- (e) If the items mentioned above are not available, use dry blankets, poncho liners, sleeping bags, or anything that will retain heat and keep that casualty dry.**
- (f) *Warm fluids are preferred if intravenous (IV) fluids are required.***

### **b. Tactical Evacuation Care**

#### **6. Prevention of Hypothermia**

- (a) Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.**
- (b) Replace wet clothing with dry if possible. *Get the casualty onto an insulated surface as soon as possible.***
- (c) *Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK) to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).***

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- (d) If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready-Heat Blanket may also be used.*
- (e) If the items mentioned above are not available, use poncho liners, sleeping bags, or anything that will retain heat and keep the casualty dry.*
- (f) Use a portable fluid warmer capable of warming all IV fluids including blood products.*
- (g) Protect the casualty from wind if doors must be kept open.**

11. The above recommendations were unanimously approved.

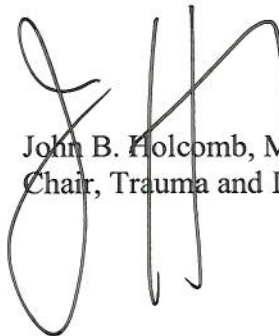
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## REFERENCES

1. Memorandum, Surgeon General of the Air Force, Incorporating Tactical Combat Casualty Care (TCCC) Course Curriculum Updates into Air Force Medical Training, August 21, 2010.
2. Presentation: Tactical Combat Casualty Care Guidelines, Pre-Hospital Life Support: Defense Health Board Update on the Trauma and Injury Subcommittee, by Dr. Frank Butler, August 18, 2010.
3. Presentation: Tactical Combat Casualty Care, Hypothermia Prevention and Fluid Resuscitation in Tactical Evacuation Care; Trauma and Injury Update on the Committee on Tactical Combat Casualty Care, by Dr. Frank Butler, August 4, 2010.
4. Memorandum, Commander, U.S. Army Training and Doctrine Command, Improvements to the Tactical Combat Casualty Care (TCCC) and the Combat Lifesaver Courses, April 8, 2010.
5. Allen PB, Salyer SW, Dubick MA, Holcomb JB, Blackburne LH. Preventing Hypothermia: Comparison of Current Devices Used by the U.S. Army with an In Vitro Warmed Fluid Model. USAISR Institutional Report, March 2010.
6. Memorandum, Surgeon General of the Navy, Policy Guidance on Updates to the Tactical Combat Casualty Care (TCCC) Course Curriculum, March 10, 2010.
7. Memorandum, Assistant Secretary of Defense for Health Affairs, Tactical Combat Casualty Care, March 4, 2010.
8. Memorandum, United States Marine Corps Commandant, Tactical Combat Casualty Care (TCCC) Guidelines and Updates, October 30, 2009.
9. Memorandum, Defense Health Board, Tactical Combat Casualty Care and Minimizing Preventable Fatalities in Combat, August 6, 2009.
10. Memorandum, Surgeon General of the Army, Mandatory Predeployment Trauma Training (PDTT) for Specified Medical Personnel, February 3, 2009.
11. Joint Theater Trauma System Clinical Practice Guideline, Hypothermia Prevention, Monitoring, and Management, November 12, 2008.
12. Memorandum, Assistant Secretary of Defense for Health Affairs, Defense-wide Policy on Combat Trauma Casualty Hypothermia Prevention and Treatment, February 16, 2006.
13. Memorandum, Commander, U.S. Special Operations Command, Tactical Combat Casualty Care Training and Equipment, March 22, 2005.

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